

# Investigation of Different Versions of Formulation of the Problem of Soundproofing of Rectangular Plates Surrounded with Acoustic Media

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## Abstract

© 2016 Springer Science+Business Media New York We consider five different formulations of the stationary problem of passage of plane acoustic waves through a rectangular plate. The first of these formulations corresponds to the application of the inertial mass model based on the hypothesis of the nondeformability of a nonfixed rigid plate in the course of its interaction with incident and plane acoustic waves formed in the surrounding half spaces. The other four statements correspond to taking into account (according to the model of the Winkler base) or neglecting the compliance of the support contour of a hingedly supported rectangular plate deformed according to the Kirchhoff model and to the application one- or three-dimensional wave equations for the description of motions of the acoustic media and the construction of the equation of motion of the plate with regard for its certain external damping. The use of these last four statements enables us to obtain smoothened graphic frequency dependences whose shapes agree with the experimental dependences obtained by testing specimens in the acoustic laboratory aimed at finding the soundproofing index of the plate.

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